APPENDIX

Appendix 1 – Pooled regression model for yield spreads on government bonds – V4

The model explains the development of government yield spread depending on debt to GDP level and current account balance (ratio to GDP) estimated on Visegrad countries. The dynamics of risk spread changes is captured by its inclusion into the explanatory variables with two lags. The explanatory variables are statistically significant at 5 % significance level (see the t-statistics and F-statistics), except for constant, which has no economic implication and impact on the dependent variable. The statistical fit of the data is approximately 93 %, the Durbin-Watson statistics indicates no autocorrelation of normal distributed random components. The lagged explanatory variables are used as instruments for the apparent mutual dependence of explanatory and explained variable.

The basic equation of the model (c – constant, β – estimated parameters, i – country, t – time):

$$\boldsymbol{yield_{i,t} = c + \beta_1 gdebt^2_{i,t} + \beta_2 ca_{i,t} + \beta_3 yield_{i,t-1} + \beta_4 yield_{i,t-2} + \varepsilon_{i,t}}$$

Variables: YIELD_i – government yield spread (Visegrad countries vs. Germany), C – constant, GDEBT_i – debt to GDP ratio, CA_i – current account balance to GDP (without transfers); i (country): Czech Republic, Hungary, Poland, and Slovakia.

Standard model output:

Dependent Variable: YIELD_i
Method: Pooled IV/Two-stage Least Squares
Sample (adjusted): 2000Q4 2014Q3
Included observations: 56 after adjustments
Cross-sections included: 4
Total pool (unbalanced) observations: 215
Instrument specification: C @PERINST GDEBT_i(-1) CA_i(-1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.000315	0.000583	-0.539330	0.5902
GDEBT_i^2	0.023519	0.003968	5.927698	0.0000
CA_i	-0.028510	0.009803	-2.908446	0.0040
YIELD_i(-1)	1.158230	0.072474	15.98137	0.0000
YIELD_i(-2)	-0.424277	0.070235	-6.040849	0.0000
R-squared	0.925421	Mean dependent var		0.021286
Adjusted R-squared	0.924001	S.D. dependent var		0.016153
S.E. of regression	0.004453	Sum squared resid		0.004164
F-statistic	258.2582	Durbin-Watson stat		2.127721
Prob(F-statistic)	0.000000	Second-Stage SSR		0.009433
Instrument rank	110			

Source: author's calculations

Appendix 2 – Names of variables and steady state growth rates

Type of Variable – steady state abbrev.)	Quarterly Growth (%)
Total Factor Productivity – TFP	0.29
Labour – L	0.01
Real variables – R	0.69
Prices – P	0.50
Real compensations per employee (labour productivity) – LP	0.68
Nominal compensations per employee – COMP	1.18
Nominal variables – N	1.19
Constant, ratios – C	0
Real interest rate – RI	1.0
Nominal interest rate – NI	1.5

Variable abbrev.	Description	Steady State abbrev.
A	Real wealth of households	R
A_N	Nominal wealth of households	N
ADJ_PENSION	Adjustment for the change in net household equity in pension funds	N
BOP_CA	Current account net balance	N
BOP_NFN	Current account net balance - income total	N
BOP_NFNK	Current account net balance - investment income	N
BOP_NFNL	Current account net balance - compensation of employees	N
BOP_TWN	Current account net balance - transfers	N
Coo	Real private consumption of households + NPISH	R
C_N	Nominal private consumption of households + NPISH	N
C_STAR	Real private consumption of households + NPISH - long run	R
CHS	Real change of stocks	R
CHS_N	Nominal change of stocks	N
CI_CE_PH	Real compensations per employee - deflated by GDP deflator	LP
CI_CE_PH_N	Nominal compensations per employee	COMP
CI_CE_PH_PC	Real compensations per employee - deflated by private consumption deflator	LP
CI_CE_PH_STAR	Real compensations per employee - deflated by GDP deflator - long run	LP
CMD	Competitors' prices on the import side in euro	P
COMPEN	Total nominal compensations of employees (GDP income approach)	N
COMPEN_FIRMS	Total compensations paid by firms	N
CONV	Convergence adjustment	C
CURGDEBT	Current government debt to GDP ratio	R/N
CURGDEF	Current government deficit to GDP ratio	R/N
CXD	Competitor's prices on the export side in euro	P
D	Real government debt	R
D_CMD	Change in competitors' prices on the import side	C
D_CXD	Change in competitors' prices on the export side	C
D_N	Nominal government debt	N
D_P_OIL	Change in oil price	C
D_WDR	Change in world demand indicator	C
DD	Real domestic demand	R
DELTA	Depreciation rate of capital	C
DELTA_G	Depreciation rate of capital – government sector	C
DEPOSITS	Deposits stocks – non-financial corporations and households	N
DIFF_LPROD	Labour productivity differential, Slovakia vs EA	C
DIFF_TFP	TFP differential, Slovakia vs EA	C
DIS	GDP identity residual / DIS = Y-(C + I + G + X - M)	R
DIS_N	GDP identity residual - nominal	N

DISP_Y	Disposable income - households	R
ERRORGDP	GDP expenditure and income approach residual	C
ETA	Share of self-employed on private employment	C
F_L	Foreign employment - EA12	L
F_LPROD	Foreign labour productivity - EA12	LP
F_M	Foreign imports - EA12	R
F_TFP	Foreign total factor productivity growth	C
F_Y	Foreign GDP - EA12	R
F_Y_SS	Steady state growth of foreign GDP	C
G	Real government consumption	R
G_CFXC	Government consumption of fixed capital	N
G_COMPEN	Compensations of government employees	COMP
G_DEF	Government deficit	N
G_EX	Total general government expenditures	N
G_EXCAP	Government total capital expenditures	N
G_EXCAPINV	Government fixed investments (part of G_EXCAP)	N
G_EXCAPSUBS	Government subsidies expenditures (part of G_EXCAP)	N
G_EXCUR	Government current transfers	N
G_EXCUROTH	Government other current transfers	N
G_EXCURSOCTRAN	Government social transfers expenditures except natural transfers	N
G_EXGOOD	Government goods and services expenditures	N
G_EXGOODNAT	Government goods and services expenditures incl. natural transfers	N
G_EXGOODNSOC	Government natural social transfers (ESA – medical equipment)	N
G_EXI	Government debt interest payments	LAM
G_EXINS	Government social and health insurance expenditures	N
G_EXW	Government wages expenditures	N
G_I	Government investments (ESA)	N
G_INTC	Government intermediate consumption (ESA)	N
G_N	Nominal government consumption	N
G_OTHTAX	Government expenditures – other taxes (ESA)	N
G_RDITAX	Government direct taxes revenues	N
G_REV	Total general government revenues	N
G_RHEAL	Government health contributions revenues	N
G_RNON	Government total nontax revenues	N
G_RNONMARKQ	Government market revenues (ESA)	N
G_RNONOTH	Government other nontax revenues	N
G_RSC	Total social contributions (health plus social) received by government	N
G_RSOC	Government social contributions revenues	N
G_RTAX	Government total taxes revenues	N
G_RTAXCIT	Government corporate income tax revenues	N
G_RTAXEXC	Government excise tax revenues	N
G_RTAXOTH	Government other taxes revenues	N
G_RTAXPIT	Government personal income tax revenues	N
G_RTAXPROP	Government property tax revenues	N
G_RTAXVAT	Government value added tax revenues	N
G_RTAXWH	Government withholding tax revenues	N
G_RUNTAX	Government indirect tax revenues	N
GAMMA	Changes in stocks – share on potential	C
GMIGOS	Gross mixed income and gross operating surplus - GDP by income appr.	N
GOS	Gross operating surplus	N
H_EXCURT	Household expenditures on current taxes on income, wealth, etc.	N
H_EXOTH	Household other current expenditures	N
H_EXPROP	Household property expenditures	N
H_EXPROPOTH	Household property expenditures – other than taxes	N
H_EXSOC	Household social contributions expenditures	N

H_EXSOCPRIV	Household social contributions expenditures – private (DSS)	N
H_RCOMP	Household compensations revenues	N
H_RGMI	Household grossed mixed income revenues	N
H_ROTH	Household other revenues	N
H_RPROP	Household property income	N
H_RSOC	Household social benefits revenues	N
HEG	HICP energy	P
HEG_STAR	HICP energy - long run	P
HEW	Ratio HICP energy/non-energy	C
HEX	HICP excluding energy	P
HEX_STAR	HICP excluding energy - long run	P
HICP	HICP	P
I	Real total gross fixed capital formation	R
I_G	Real total gross capital formation	R
I_G_N	Nominal total gross capital formation	N
I_N	Nominal total investments	N
IFO_R3	Business expectation in trade and industry, index	R
IRM	Risk premium and effective interest rate adjustment	C
K	Capital stock	R
K_PRIV	Capital stock - private sector	R
L	Total employment (ESA)	L
L_ABROAD	Abroad employment - ILO	L
L_EM	Total employees (ESA)	L
L_FIRMS	Employment in private sector (employees plus self-employed)	L
L_GOV	Government employees	L
L_POT	Potential employment	L
L_SE	Total self-employment	L
L_STAR	Total employment - long run	L
LAMBDA	Risk premium on government bonds yield	LAM
LF	Labour force	L
LPROD	Labour productivity	LP
LPROD_POT	Potential labour productivity - long run	LP
M	Real imports of goods and services	R
M_N	Nominal imports of goods and services	N
M_STAR	Real imports - long run	R
MARG	Firm's margin	N
NAIRU	NAIRU	C
NIF	Firm's loans interest payments	N
NX	Real net exports	R
NX_N	Nominal net exports	N
OMEGA	Share of private capital	C
P_OIL	Oil prices in USD (Brent)	P
P_OILEUR	Oil prices in EUR (Brent)	P
PC	Private consumption deflator	P
PC_STAR	Private consumption deflator - long run	P
PG	Government consumption deflator	P
PG_STAR	Government consumption deflator - long run	P
PI	Investment deflator	P
PI_STAR	Investment deflator - long run	P
PM	Import deflator	P
PQ	Value added of firms deflator	P
PM_STAR	Import deflator - long run	P
PRIMDEF	Government primary deficit	N
PROFIT	Firm's profits	N
PX	Export deflator	P

PX_STAR	Export deflator - long run	P
PY	GDP deflator	P
PY_STAR	GDP deflator - long run	P
R	Real interest rate	RI
R_C	Real interest rate for private consumption of HH	RI
R_GEXCAPINV	Ratio of government fixed investment expenditures to value added	C
R_GEXCAPSUBS	Ratio of government subsidies expenditures to value added of firms	C
R_GEXCUROTH	Ratio of government other current transfers to GDP	C
R_GEXGOODNSOC	Ratio of government natural social transfers to GDP	C
R_GEXGOODS	Ratio of government intermediate consumption to GDP	C
R_GEXW	Ratio of average government wage to private wage	C
R_GRHEAL	Effective rate of health insurance contributions	C
R_GRNONMARKQ	Ratio of government market production revenues to value added	C
R_GRNTAX	Ratio of government other nontax revenues to value added	C
R_GRSOC	Effective rate of social insurance contributions	C
R_HEXOTH	Ratio of household other expenditures to nominal GDP	C
R_HEXPROPOTH	Ratio of household other property expenditures to nominal GDP	C
R_HRGMI	Ratio of household mixed income revenues to firm margin less taxes	C
R_HROTH	Ratio of household other revenues to household other expenditures	C
R_HRPROP	Ratio of household property revenues to value added of firms	C
R_LGOV	Ratio of public employees to private employment	C
R_NFNK	Ratio of capital outflow to total capital	C
R_NFNL	Ratio of foreign labour income revenues to GDP	C
R_SCF	Rate of social contributions by firms	C
R_SCW	Rate of social contributions by wage earners	C
R_SCWPRIV	Rate of social contributions of wage earners to private companies (DSS)	C
R_TAXCIT	Effective corporate income tax rate	C
R_TAXEXC	Effective excise tax rate	C
R_TAXEXCo	Base year effective excise tax rate	C
R_TAXOTH	Effective other tax rate	C
R_TAXPIT	Effective personal income tax rate	C
R_TAXPROP	Effective property tax income rate	C
R_TAXVAT	Effective value added tax rate	C
R_TAXVATo	Base year effective value added tax rate	C
R_TAXWH	Effective withholding tax rate	C
R_TWN	Ratio of foreign transfers to GDP	C
RENEGOT	Share of renegotiated government debt	C
RER_M	Real exchange rate - import side	C
RER_X	Real exchange rate - export side	C
RES_*	Residuals of long- and short-term equations	C
RES_GCOMPEN	Government employees compensations residual	C
RES_GEXINS	Government employees contributions residual	C
RES_GI	Government fixed investments residual	C
RES_GINTC	Government intermediate consumption residual	C
RES_HEXCURT	Household current transfers expenditures residual	C
RES_HEXSOC	Household social expenditures residual	C
RES_HRCOMP	Household compensations revenues residual	C
RHO	Labour participation rate	C
RN	Nominal interest rate	NI
RN_3M	Euribor 3M	NI
RN_C	Nominal interest rate for private consumption of HH	NI
RX_EUR	Exchange rate EUR/SKK	C
RX_USD	Exchange rate USD/SKK	C
RX_USDEUR	Exchange rate USD/EUR	C
SCF	Social contributions of employers by firms	N

SCW	Social contributions of employees by wage earners	N
SD	Statistical discrepancy - GDP constant prices	C
SPEEDVAL	Consolidation speed value	C
SRATIO	Savings ratio of households	C
TARGDEBT	Government target debt to GDP ratio	C
TARGDEF	Government target deficit to GDP ratio	C
TAXCITBASE	Tax base for corporate income tax	C
TAXEXCBASE	Tax base for excise tax	C
TAXOTHBASE	Tax base for other taxes	C
TAXPITBASE	Tax base for personal income tax	C
TAXPROPBASE	Tax base for property taxes	C
TAXVATBASE	Tax base for value added tax	C
TAXWHBASE	Tax base for withholding tax	N
TFP	TFP	TFP
TIME, TIMEA	Dummy trends	T
U_GAP	Unemployment gap	C
ULC	Unit labour costs	P
ULC_POT	Potential labour costs	P
UN	Unemployment - heads	L
UR	Unemployment rate (ILO)	C
UR_ESA	Unemployment rate - ESA	C
VA	Value added (firms) – nominal	N
VAP	Value added – real	R
WAGE	Wage base (total gross wages in the economy)	N
WAGEFIRMS	Total gross wages in private sector	N
WAGEGOV	Total gross wages in public sector	N
WAP	Working age population	L
WDI	Import demand indicator	R
WDR	World demand indicator	R
WFIRMS	Average gross wage in private sector	COMP
WGOV	Average gross wage in public sector	COMP
WREAL	Real average wage per employee in private sector	LP
X	Real exports of goods and services	R
X_N	Nominal exports of goods and services	N
X_STAR	Real exports - long run	R
XI	Share of abroad labour on labour force	C
Y	Real GDP	R
Y_GAP	Output gap	C
Y_MARKET	Real market GDP – real GDP less real compensations of public employees	R
Y_MARKET_N	Nominal market GDP	N
Y_N	Nominal GDP	N
Y_POT	Potential GDP	R
YNX	Ratio of real net export of goods and services to real GDP	C
YNX_N	Ratio of nominal net export of goods and services to nominal GDP	C

Source: author

Appendix 3 – Equations

Foreign Sector

```
LOG_F_Y_SS = LOG(1 + F_L_SS) + (1 / (1 - BETA)) * LOG(1 + F_TFP_SS)
F_Y_SS = EXP(LOG_F_Y_SS)-1
F_Y = (0.75 * F_Y(-1) / F_Y(-2) + (1 - 0.75) * (1 + F_Y_SS)) * F_Y(-1)
F_L = (0.75 * F_L(-1) / F_L(-2) + (1 - 0.75) * (1 + F_L_SS)) * F_L(-1)
F_M = (0.75 * F_M(-1) / F_M(-2) + (1 - 0.75) * (1 + F_Y_SS)) * F_M(-1)
D_WDR = 0.96 * WDR(-1) / WDR(-2) + (1 - 0.96) * (1 + F_Y_SS) + RES_D_WDR
WDR =D_WDR * WDR(-1)
D_CMD = (0.75 * CMD(-1) / CMD(-2) + (1 - 0.75) * (1 + F_PY_SS)) + RES_D_CMD
CMD =D_CMD * CMD(-1)
D_CXD = (0.75 * CXD(-1) / CXD(-2) + (1 - 0.75) * (1 + F_PY_SS)) + RES_D_CXD
CXD =D_CXD * CXD(-1)
F_TFP=F_TFP_SS*100
D_P_OIL = (0.75 * P_OIL(-1) / P_OIL(-2) + (1 - 0.75) * (1 + F_PY_SS)) + RES_SHOCK_OILRULE
P_OIL =D_P_OIL * P_OIL(-1)
P_OILEUR=P_OIL/EX_USDEUR
F_LPROD = F_Y / F_L
RX_USD = RX_EUR / RX_USDEUR
RX_USDEUR = 0.75 * RX_USDEUR(-1) + 0.25 * USDEUR_SS
```

Supply side

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TFP = (0.6 * TFP(-1) / TFP(-2) + (1 - 0.6) * (1 + F_TFP_SS) + CONV / 100) * TFP(-1)
LAMBDA[1]= 0.0235191259468 * CURGDEBT^2 - 0.0285100585103 * NX_N/Y_N + 1.15822989701 * LAMBDA(-1) -
  0.424277408998 * LAMBDA(-2)
LOG(Y_POT) = (1 - BETA) * LOG(L_POT) + BETA * LOG(K(-1)) + LOG(TFP)
DELTA =DELTA(-1)+0.5*(DELTA(-1)-DELTA(-2))-(1-0.9)*(DELTA(-1)-DELTA_SS)
DELTA_G=DELTA_G(-1)
K = (1 - DELTA) * K(-1) + I
WAP = (0.85 * WAP(-1) / WAP(-2) + (1 - 0.85) * (1 + F_L_SS)) * WAP(-1)
NAIRU = 0.85* NAIRU(-1) + 0.15 * NAIRU_SS
L_POT = (LF - L_ABROAD) * (1 - NAIRU)
XI = XI(-1)
L_ABROAD = XI * LF
RHO= LF/WAP
LF=LF(-1)*(1+F_L_SS)+C_LF1*D(R_TAXPIT)*LF(-1)+C_LF2*D(R_SCW)*LF(-1)
    (C_LF1 = -1.0 (calibration); C_LF2=-1.0 (calibration)
LOG(L_STAR) = 1 / (1 - BETA) * (LOG(Y) - LOG(TFP) - BETA * LOG(K(-1))) + RES_L_STAR
DLOG(L_FIRMS)=C_L(1)*DLOG(L_POT)+(1-C_L(1)-C_L(2))*(DLOG(Y)-(DLOG(TFP)/(1-
0.57)))+C_L(2)*DLOG(L_FIRMS(-1))+C_L(3)*(DLOG(CI_CE_PH)-(DLOG(TFP)/(1-0.57)))+C_L(4)*(LOG(L_FIRMS(-
1)+L_GOV(-1))-LOG(L_STAR(-1)))+C_L(5)*(LOG(L_FIRMS(-1)+L_GOV(-1))-LOG(L_POT(-1)))+RES_DLOG_L
CI_CE_PH_N = CI_CE_PH * PY
CI_CE_PH = (CI_CE_PH_PC*PC) / PY
CI_CE_PH_PC = (WAGE*(1+R_SCF))/(PC*L_EM)
ETA = ETA(-1)
Y_GAP = Y / Y_POT
UR = UN / LF
UR_ESA = 1 - L / (LF - L_ABROAD)
UN = LF - L - L_ABROAD
LPROD = Y / L
LPROD_POT = Y_POT / L_POT
U_GAP = UR_ESA - NAIRU
```

[1] See Appendix 1.

ULC_POT =CI_CE_PH_N * L_POT / Y_POT
ULC =CI_CE_PH_N * L / Y
L_EM = L_FIRMS + L_GOV – L_SE
L_SE = ETA * L_FIRMS
L = L_FIRMS + L_GOV
DLOG(DIFF_LPROD) = DLOG(F_LPROD) - DLOG(LPROD_POT)
DLOG(DIFF_TFP) = DLOG(TFP) - LOG(1 + F_TFP_SS)

Demand side - households

A =(K_PRIV*PI+X_N-M_N+BOP_NFNK+BOP_TWN+D_N)/PC
A_N =K_PRIV*PI+D_N+X_N-M_N+BOP_NFNK+BOP_TWN
D_N = D_N(-1) + G_EXI +(-PRIMDEF)
K_PRIV=OMEGA*K
OMEGA=OMEGA(-1)
SRATIO= (((((DISP_Y+ADJ_PENSION/PC)*PC)-C00*PC)/((DISP_Y+ADJ_PENSION/PC)*PC))*100)/100
LOG(C_STAR) = C_CSTAR(1)+C_CSTAR2*LOG(DISP_Y)+(1-C_CSTAR2)*
LOG(A)+C_CSTAR(3)*(1/TIMEA)*(TIME<2004)+C_CSTAR(4)*(1/TIMEA)*(TIME>2009.25)+RES_C_STAR
Calibrated parameters: C_CSTAR(1) = -0.136357; C_CSTAR2 = 0.968458; C_CSTAR(3)=-1.424345; C_CSTAR(4)=-1.543891; **R-squared**: 0.992
Engle-Granger cointegration test: tau-statistics: p-value 0.00, z-statistics: p-value 0.00 (the null hypothesis of no cointegration is rejected both at 5% level).
DLOG(C00) =C_C(1)*DLOG(C00(-1))+(1-C_C(1))*DLOG(DISP_Y)+C_C2*(R-R(-2))+C_C(3)*(LOG(C00(-1))-LOG(C_STAR(-1)))+RES_DLOG_C+C_C(4)*(TIME=1999.5)+C_C(5)*(TIME=1999.75)
Calibrated parameter: C_C2 = -0.04
DISP_Y = (H_RCOMP+H_RGMI+H_RPROP+H_RSOC+H_ROTH-H_EXPROP-H_EXCURT-H_EXSOC-H_EXOTH)/PC
H_RCOMP = COMPEN+BOP_NFNL+RES_HRCOMP
RES_HRCOMP=RES_HRCOMP(-1)*0.9
R_HRGMI =R_HRGMI(-1)
H_RGMI =(R_HRGMI *VA)*PC
GMIGOS =GOS + H_RGMI
R_HRPROP =R_HRPROP (-1)
H_RPROP =R_HRPROP(-1) *VAP
H_RSOC =H_RSOC(-1)*(Y_N/Y_N(-1))
R_HROTH=R_HROTH(-1)
H_ROTH =R_HROTH*H_EXOTH
R_HEXPROPOTH=R_HEXPROPOTH(-1)
H_EXPROPOTH=R_HEXPROPOTH*Y_N
H_EXPROP=G_RTAXPROP+H_EXPROPOTH
RES_HEXCURT=RES_HEXCURT(-1)*0.9
H_EXCURT = G_RTAXPIT + RES_HEXCURT
R_SCWPRIV=R_SCWPRIV(-1)
H_EXSOCPRIV=R_SCWPRIV*WAGE
H_EXSOC = G_RSOC + G_RHEAL + H_EXSOCPRIV + RES_HEXSOC
RES_HEXSOC = RES_HEXSOC(-1) *0.9
DLOG(ADJ_PENSION) = DLOG(H_EXSOCPRIV)
R_HEXOTH=R_HEXOTH(-1)
H_EXOTH=R_HEXOTH(PY*Y)
BOP_CA = X_N - M_N + BOP_NFN + BOP_TWN
BOP_NFN = BOP_NFNK + BOP_NFNL
R_NFNK = R_NFNK(-1)
BOP_NFNK =R_NFNK * (K*PI)
R_NFNL =R_NFNL(-1)
BOP_NFNL =R_NFNL * (PY*F_Y)
R_TWN =R_TWN(-1)
BOP_TWN00 =R_TWN * (PY*Y)

Demand side – government

G_N=(G_COMPEN+G_INTC+G_OTHTAX+G_CFXC-G_RNONMARKQ+G_EXGOODNSOC)
G_COMPEN=G_EXW+G_EXINS+RES_GCOMPEN
RES_GCOMPEN=RES_GCOMPEN(-1)*0.9
G=G_N/PG
G_OTHTAX=G_OTHTAX(-1)*0.9
R_GRNONMARKQ=R_GRNONMARKQ(-1)
G_RNONMARKQ=R_GRNONMARKQ*VAP
G_CFXC=DELTA_G*(K(-1)-K_PRIV(-1))*PI

Demand side – other GDP components

DLOG(I) = C_I1*((R(-1)+DELTA(-1)+LAMBDA+(R_TAXCIT(-1)-@MEAN(R_TAXCIT(-1),"2003Q1 2014Q3")))-(BETA*Y(-1)/K(-1)))+C_I2*D(R)+(1-C_I(3)-C_I(4))*DLOG(G_I/PI)*(TIME>2004.25)+C_I(3)*DLOG(@MOVAV(PROFIT(-1)/PI(-1),3)) +C_I(4)*DLOG(Y)+C_I(5)*(TIME=1999)+C_I(6)*(TIME=1999.5)+C_I(7)*@MOVAV(D(R_TAXCIT(-2)),2)+RES_DLOG_I

Calibrated parameters: C_I1 = -0.06; C_I2 = -0.19

LOG(X)=C_XSTAR(1)+LOG(WDR)+C_XSTAR(2)*LOG(RER_X)+C_XSTAR(3)*LOG(DIFF_TFP)+C_XSTAR(4)*LOG(DIFF_LPROD)+C_XSTAR(5)*(TIME=2009)+RES_X_STAR

Calibrated parameters: C_XSTAR(1)=7.964120; C_XSTAR(2) = -0.319545; C_XSTAR(3)=1.708164; C_XSTAR(4)=-0.867559; C_XSTAR(5)=-0.174639; **R-squared**: 0.989

Engle-Granger cointegration test: tau-statistics: p-value 0.08, z-statistics: p-value 0.05 (the null hypothesis of no cointegration is rejected at 8% level and 5% level).

DLOG(X) = DLOG(WDR)+C_X(2)*DLOG(RER_X)+C_X(3)*DLOG(DIFF_TFP)+C_X(4)*(LOG(X(-1))-LOG(X_STAR(-1)))+C_X(5)*(TIME=2009)+C_X(6)*DLOG(RX_USD)+RES_DLOG_X
WDI = 0.3 * C00 + 0.51 * I + 0.07 * G + 0.6 * X
LOG(M) = C_MSTAR(1)+LOG(WDI) +C_MSTAR(2)*LOG(RER_M)+RES_M_STAR

Calibrated parameters: C_MSTAR(1)=0.035634; C_MSTAR(2) = 1.353044; **R-squared**: 0.977

Engle-Granger cointegration test: tau-statistics: p-value 0.01, z-statistics: p-value 0.01 (the null hypothesis of no cointegration is rejected at both at 5% level).

DLOG(M) =C_M(1)*DLOG(WDI)+C_M2*DLOG(RER_M) +C_M(2)*(LOG(M(-1)) - LOG(M_STAR(-1)))+C_M(3)*(TIME=1999)+RES_DLOG_M

Calibrated parameters: C_M2 = 0.219828

DD=C00+I+G
DLOG(RER_M)=DLOG(PY)-DLOG(PM)
RER_X=PX/CXD
DIS=GAMMA*Y_POT
Y=C00+I+G+X-M+DIS

Wages and prices

LOG(CI_CE_PH_STAR) = LOG(1 - BETA) + LOG(Y_POT / L_POT) + RES_CICE
DLOG(WREAL) =C_COMP(1)*DLOG(VA/L_FIRMS)+(1-C_COMP(1))*DLOG(LPROD(-1))+C_COMP(2)*(DLOG(PC)-DLOG(PY))+C_COMP3*(UR_ESA(-1)-NAIRU(-1))+C_COMP4*D(R_SCF)+C_COMP5*D(R_SCW(-1))+C_COMP6*(LOG(CI_CE_PH(-1))-LOG(CI_CE_PH_STAR(-1)))+C_COMP(8)*DLOG(PROFIT(-4)/PI(-4))+C_COMP(9)*(TIME=1998.75)+RES_D_CI_CE_PH

Calibrated parameters: C_COMP3 = -0.079; C_COMP4=-0.604669; C_COMP5=0.034803, C_COMP6=-0.017

LOG(PY_STAR)=LOG(ULC)-LOG(1-BETA)
DLOG(PY)=C_PY(1)* DLOG(PM) +C_PY2 * LOG(Y_GAP) + (1 - C_PY1) * DLOG(PY(-1)) + C_PY3 * (LOG(PY(-1)) - LOG(PY_STAR(-1))) +RES_DLOG_PY

Calibrated parameters: C_PY(1)= 0.258376; C_PY2=0.05; C_PY3=-0.02

LOG(PC_STAR)=C_PCSTAR(1)+LOG(HICP)+ RES_PC_STAR
DLOG(PC) = DLOG(PC_STAR) + RES_DLOG_PC
HICP = HICP(-1) * (1 + (HEW * (HEG / HEG(-1) - 1) + (1 - HEW) * (HEX / HEX(-1) - 1)))
LOG(HEG) =C_HEGSTAR(1) + C_HEGSTAR(2)*LOG(@MOVAV(P_OIL*RX_USD,2)) + (1-C_HEGSTAR(2))*LOG(PY)+C_HEGSTAR(3)*(R_TAXEXC)*(TIME>2002.75)+C_HEGSTAR(4)*(1/TIMEA)+RES_HEG_STAR

Calibrated parameters: C_HEGSTAR(1)=3.617758; C_HEGSTAR(2) = 0.182755; C_HEGSTAR(3)=0.863679; C_HEGSTAR(4)=-14.36292; **R-squared**: 0.991

Engle-Granger cointegration test: tau-statistics: p-value 0.00, z-statistics: p-value 0.00 (the null hypothesis of no cointegration is rejected at both at 5% level).

DLOG(HEG) =C_HEG(1)*DLOG(PY)+(1-C_HEG(1))*DLOG(@MOVAV(P_OIL*RX_USD,2))+ C_HEG(2)*D(R_TAXEXC)*(TIME>2006.5) +C_HEG(3)*(LOG(HEG(-1))-LOG(HEG_STAR(-1)))+C_HEG(4)*(TIME=1999.5)+C_HEG(5)*@SEAS(1)*(TIME<2014)+ RES_DLOG_HEG

LOG(HEX_STAR) =C_HEXSTAR(1) +LOG(PY)+C_HEXSTAR(2)*(R_TAXVAT)*(TIME>2007.25)+ C_HEXSTAR(3)*(1/TIMEA)*(TIME>2011.75)+C_HEXSTAR(4)*(TIME=2008)+RES_HEX_STAR

Calibrated parameters: C_HEXSTAR(1)=4.665752; C_HEXSTAR(2) =0.314813; C_HEXSTAR(3)=3.671542; C_HEXSTAR(4)=--0.040809; **R-squared**: 0.994

Engle-Granger cointegration test: tau-statistics: p-value 0.00, z-statistics: p-value 0.00 (the null hypothesis of no cointegration is rejected at both at 5% level).

DLOG(HEX) =C_HEX(1) * DLOG(CMD(-1))+C_HEX(2)*DLOG(PY)+ (1-C_HEX(1)-C_HEX(2))*DLOG(HEX(-1))+C_HEX(3)*D(@MOVAV(R_TAXVAT,4))+C_HEX(4)*(LOG(HEX(-1))-LOG(HEX_STAR(-1)))+C_HEX(5)*LOG(Y_GAP)+C_HEX(6)*@SEAS(1)*(TIME<2014)+C_HEX(7)*(TIME=2003)+RES_DLOG_HEX

HEW = HEW(-1) * ((HEG(-1) / HEG(-2)) / (HICP(-1) / HICP(-2)))

LOG(PI_STAR) = C_PISTAR(1)+ C_PISTAR(2)*LOG(PY)+(1-C_PISTAR(2))*LOG(PM)+ C_PISTAR(3)*(1/TIMEA)*(TIME>2009.75)+RES_PI_STAR

Calibrated parameters: C_PISTAR(1)=0.035361; C_PISTAR(2) = 0.418828; C_PISTAR(3)=-4.173730; **R-squared**: 0.969

Engle-Granger cointegration test: tau-statistics: p-value 0.00, z-statistics: p-value 0.00 (the null hypothesis of no cointegration is rejected at both at 5% level).

DLOG(PI) =(1-C_PI(1))*DLOG(PI(-1))+C_PI(1)*DLOG(PY(-2))+C_PI(2)*(LOG(PI(-1))-LOG(PI_STAR(-1)))+RES_DLOG_PI

LOG(PG_STAR) =C_PGSTAR(1)*LOG(PC)+(1-C_PGSTAR(1))*LOG(PI)+C_PGSTAR(2)*(TIME=1998.75)+ C_PGSTAR(3)*(TIME=1998.5)+C_PGSTAR(4)*(TIME>2009)*(1/TIMEA)+RES_PG_STAR

Calibrated parameters: C_PGSTAR(1)=0.861124; C_PGSTAR(2) 0.057519; C_PGSTAR(3)=0.055394; C_PGSTAR(4)=-0.899253; **R-squared**: 0.992

Engle-Granger cointegration test: tau-statistics: p-value 0.00, z-statistics: p-value 0.00 (the null hypothesis of no cointegration is rejected at both at 5% level).

DLOG(PG) =(1-C_PG(1))*DLOG(PI)+C_PG(1)*DLOG(PC)+C_PG(2)*(LOG(PG(-1))-LOG(PG_STAR(-1)))

LOG(PM_STAR) = C_PMSTAR(1)+C_PMSTAR(2)*LOG(CMD)+(1-C_PMSTAR(2)-C_PMSTAR(3))*LOG(@MOVAV(P_OIL*RX_USD, 2))+C_PMSTAR(3)*LOG(PY)+RES_PM_STAR

Calibrated parameters: C_PMSTAR(1)=-1.085215; C_PMSTAR(2)= 0.154049; C_PMSTAR(3)=0.154049; **R-squared**: 0.906

Engle-Granger cointegration test: tau-statistics: p-value 0.01, z-statistics: p-value 0.03 (the null hypothesis of no cointegration is rejected at both at 5% level).

DLOG(PM) =C_PM(1)*DLOG(CMD) + (1-C_PM(1))*(DLOG(@MOVAV(P_OIL*RX_USD,2)))+ C_PM(5)*(LOG(PM(-1))-LOG(PM_STAR(-1)))+C_PM(6)*(TIME=1999.25)+C_PM(7)*(TIME=2010)+RES_DLOG_PM

LOG(PX_STAR) = C_PXSTAR(1)+C_PXSTAR(2)*LOG(PY)+(1-C_PXSTAR(2))*LOG(CXD)+RES_PX_STAR

Calibrated parameters: C_PXSTAR(1)=-0.850987; C_PXSTAR(2)= 0.743972; **R-squared**: 0.867

Engle-Granger cointegration test: tau-statistics: p-value 0.01, z-statistics: p-value 0.01 (the null hypothesis of no cointegration is rejected at both at 5% level).

DLOG(PX) =C_PX(1)*DLOG(PY) + (1-C_PX(1))*DLOG(CXD) +C_PX(2)*(LOG(PX(-1))-LOG(PX_STAR(-1))) +C_PX(3)*(TIME=2000)+C_PX(4)*(TIME=1999)+RES_DLOG_PX

Other

Y_N = PY * Y+ERRORGDPY

C_N = PC * Coo

I_N = PI * I

X_N = PX * X

M_N = PM * M

NX_N =X_N - M_N

RN = 0.75 * RN(-1) + 0.0 * LAMBDA + (1 - 0.75) * RN_SS + 0.0 * LOG(Y_GAP) + RES_RN

R = (1 + RN) / (PY / PY(-1)) - 1

RN_3M = 0.75 * RN_3M(-1) + 0.0 * LAMBDA + (1 - 0.75) * RN_SS + 0.0 * LOG(Y_GAP) + RES_RN_3M

```
RN_C = 0.75 * RN_C(-1) + 0.0 * LAMBDA + (1 - 0.75) * RN_SS + 0.0 * LOG(Y_GAP) + RES_RN
R_C = (1 + RN_C) / (PY / PY(-1)) - 1
NX = X - M
CHERR =CHERR(-1)
CHS = DIS - CHERR
I_G = I + CHS
S = S(-1) + CHS
I_G_N = PI * I_G
CHS_N =I_G_N - I_N
S_N = S_N(-1) + CHS_N
DIS_N =Y_N - C_N - I_N - G_N - (X_N - M_N)
```

GDP – income approach

```
COMPEN=WAGE+SCF
SCF=R_SCF*WAGEFIRMS+R_SCF*WAGEGOV
SCW=R_SCW*WAGE
WAGEGOV=WGOV*L_GOV
WAGEFIRMS=WFIRMS*(L_EM-L_GOV)
WFIRMS=WREAL*PC
WAGE=WAGEFIRMS+WAGEGOV
GOS=GOS(-1)*(PROFIT/PROFIT(-1))
ERRORGDP=ERRORGDP(-1)*0.9
```

Government block

```
SPEEDVAL = (WEIGHTDEBT / CONSPEED / 10 * (CURGDEBT - TARGDEBT) + WEIGHTDEFICIT / CONSPEED *
(TARGDEF - CURGDEF) + WEIGHTGAP / CONSPEED * (Y_GAP(-1) -1)) * Y_N
TAXPITBASE = WAGE
R_TAXPIT =R_TAXPIT(-1) + C_TXPITRULE1 + C_TXPITRULE2 + C_TXPITRULE3 + RES_SHOCK_PITRULE
G_RTAXPIT =R_TAXPIT * TAXPITBASE
TAXCITBASE = PROFIT
R_TAXCIT =R_TAXCIT(-1) + C_TXCITRULE1 + C_TXCITRULE2 + C_TXCITRULE3 + RES_SHOCK_CITRULE
G_RTAXCIT = R_TAXCIT * TAXCITBASE
DEPOSITS =DEPOSITS(-1)*(WAGE/WAGE(-1))
TAXWHTBASE = 0.7*(DEPOSITS*RN)+0.3*VAP
R_TAXWH = R_TAXWH(-1) + C_TXWHRULE1 + C_TXWHRULE2 + C_TXWHRULE3 + RES_SHOCK_WHRULE
G_RTAXWH =R_TAXWH * TAXWHTBASE
TAXPROPBASE = H_RPROP
R_TAXPROP = R_TAXPROP(-1) + C_TXPROPRULE1 + C_TXPROPRULE2 + C_TXPROPRULE3 +
RES_SHOCK_PROPRULE
G_RTAXPROP = R_TAXPROP * TAXPROPBASE
TAXVATBASE = (C00*PC+G_I+G_INTC)/(1+R_TAXVAT(-1))
G_I=G_EXCAPINV+RES_GI
RES_GI=RES_GI(-1)*0.9
G_INTC=G_EXGOOD+RES_GINTC
RES_GINTC=RES_GINTC(-1)*0.9
R_TAXVAT = R_TAXVAT(-1) + C_TXVATRULE1 + C_TXVATRULE2 + C_TXVATRULE3 +
RES_SHOCK_VATRULE
G_RTAXVAT =R_TAXVAT * TAXVATBASE
TAXEXCBASE = C00 * PC
R_TAXEXC =R_TAXEXC(-1) + C_TXEXCRULE1 + C_TXEXCRULE2 + C_TXEXCRULE3 + RES_SHOCK_EXCRULE
```

G_RTAXEXC = R_TAXEXC * TAXEXCBASE
TAXOTHBASE =VAP
R_TAXOTH = R_TAXOTH(-1) + C_TXOTHRULE1 + C_TXOTHRULE2 + C_TXOTHRULE3 + RES_SHOCK_OTHRULE
G_RTAXOTH =R_TAXOTH * TAXOTHBASE
G_RSC=R_SCF*WAGEFIRMS+R_SCW*WAGE+R_SCF*WAGEGOV
R_SCF=R_SCF(-1)+ C_SOCFRULE1+ C_SOCFRULE2+C_SOCFRULE3+ RES_SHOCK_SOCFRULE
R_SCW=R_SCW(-1)+C_SOCWRULE1+C_SOCWRULE2+C_SOCWRULE3+RES_SHOCK_SOCWRULE
R_GRSOC=R_GRSOC(-1)
R_GRHEAL=R_GRHEAL(-1)
G_RSOC=R_GRSOC*G_RSC
G_RHEAL=R_GRHEAL*G_RSC
G_RNON = G_RNONOTH+G_RNONMARKQ
R_GRNTAX=R_GRNTAX(-1)
G_RNONOTH=R_GRNTAX*(VA*PY)
L_GOV=R_LGOV*L_FIRMS
R_LGOV=R_LGOV(-1)+C_WAGRULEL1+C_WAGRULEL2+C_WAGRULEL3+RES_SHOCK_WAGRULEL
R_GEXW=R_GEXW(-1)+C_WAGRULEG1+C_WAGRULEG2+C_WAGRULEG3+RES_SHOCK_WAGRULEG
WGOV=R_GEXW*WFIRMS
G_EXW=WGOV*L_GOV
R_GEXINS =R_SCF*G_EXW+RES_GEXINS
RES_GEXINS=RES_GEXINS(-1)*0.9
G_EXGOODNSOC=R_GEXGOODNSOC*(Y_N)
R_GEXGOODNSOC=R_GEXGOODNSOC(-1)
G_EXGOODNAT=G_EXGOOD+G_EXGOODNSOC
R_GEXGOODS=R_GEXGOODS(-1)+C_CGOVRULE1+C_CGOVRULE2+C_CGOVRULE3+RES_SHOCK_GOODRULE
G_EXGOOD =R_GEXGOODS*(Y_POT*PY)
G_EXCURSOCTRAN=H_RSOC
G_EXCUR=G_EXCURSOCTRAN+G_EXCUROTH
R_GEXCUROTH=R_GEXCUROTH(-1)+C_EXCURRULE1+C_EXCURRULE2+C_EXCURRULE3+RES_SHOCK_CUROTHRULE
G_EXCUROTH=R_GEXCUROTH*(Y_POT*PY)
IRM = RENEGOT * IRM(-1) + (1 - RENEGOT) * (LAMBDA)

Calibration: renegot=0.95

G_EXI = IRM*D_N(-1)
G_EXCAP=G_EXCAPINV+G_EXCAPSUBS
R_GEXCAPINV=R_GEXCAPINV(-1)+C_IGOVRULE1+C_IGOVRULE2+C_IGOVRULE3+RES_SHOCK_CAPRULE
G_EXCAPINV=R_GEXCAPINV*VAP
R_GEXCAPSUBS=R_GEXCAPSUBS(-1)+C_ISUBGOVRULE1+C_ISUBGOVRULE2+C_ISUBGOVRULE3+RES_SHOCK_SUBSRULE
G_EXCAPSUBS=R_GEXCAPSUBS*VAP
G_REV = G_RTAXPIT + G_RTAXCIT + G_RTAXWH + G_RTAXPROP + G_RTAXVAT + G_RTAXEXC + G_RTAXOTH + G_RSOC + G_RHEAL + G_RNON
G_RUNTAX = G_RTAXVAT + G_RTAXEXC
G_EX = G_EXW + G_EXINS + G_EXGOODNAT + G_EXCUR + G_EXI + G_EXCAPINV + G_EXCAPSUBS
G_DEF = G_REV - G_EX
CURGDEBT =D_N / (Y_N * 4)
CURGDEF = (G_DEF(-1) + G_DEF(-2) + G_DEF(-3) + G_DEF(-4)) / (Y_N(-1) + Y_N(-2) + Y_N(-3) + Y_N(-4))

Firms
COMPEN_FIRMS=WAGEFIRMS*(1+R_SCF)
Y_MARKET=Y-WAGEGOV/(HICP/100)*(1+R_SCF)
Y_MARKET_N=Y_N-WAGEGOV*(1+R_SCF)
VA= Y_MARKET-G_RTAXVAT*R_TAXVAT0/R_TAXVAT/(PC*(1+R_TAXVAT0)/(1+R_TAXVAT))- G_RTAXEXC*R_TAXEXC0/R_TAXEXC/(PC*(1+R_TAXEXC0)/(1+R_TAXEXC))
VAP=Y_MARKET_N-G_RTAXVAT-G_RTAXEXC
PQ=VAP/VA
NIF=0.002*Y_N
MARG-VAP-WAGEFIRMS*(1+R_SCF)+G_EXCAPSUBS
PROFIT=MARG-NIF-H_RGMI-G_RTAXCIT-G_RTAXWH-G_RTAXOTH

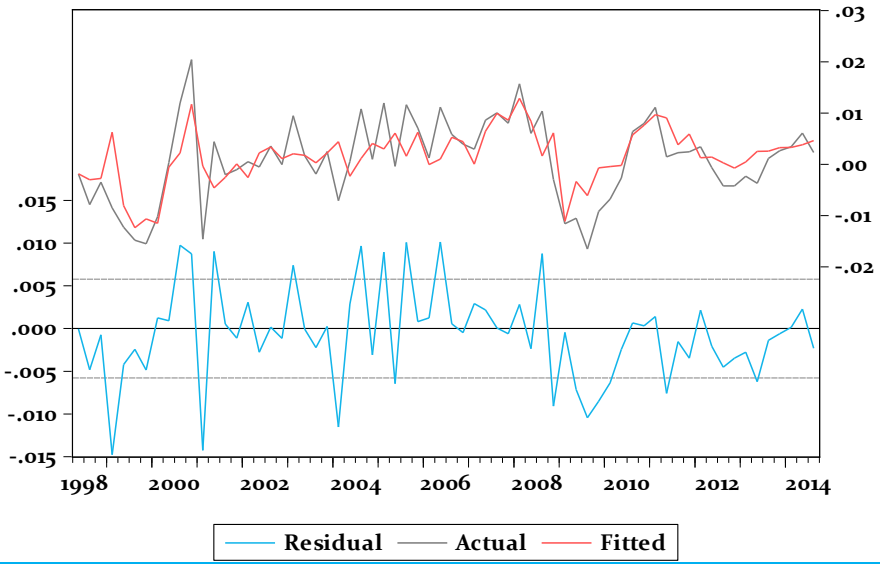
Appendix 4 – Estimated equations

Private employment

Dependent Variable: DLOG(L_FIRMS)
Method: Least Squares
Sample (adjusted): 1998Q2 2014Q3
Included observations: 66 after adjustments
DLOG(L_FIRMS)=C_L(1)*DLOG(L_POT)+(1-C_L(1)-C_L(2))
*(DLOG(Y)-(DLOG(TFP)/(1-0.57)))+C_L(2)*DLOG(L_FIRMS(
-1))+C_L(3)*(DLOG(CI_CE_PH)-(DLOG(TFP)/(1-0.57)))+C_L(4)
*(LOG(L_FIRMS(-1)+L_GOV(-1))-LOG(L_STAR(-1)))+C_L(5)
*(LOG(L_FIRMS(-1)+L_GOV(-1))-LOG(L_POT(-1)))
+RES_DLOG_L

	Coefficient	Std. Error	t-Statistic	Prob.
C_L(1)	0.534684	0.092487	5.781164	0.0000
C_L(2)	0.318182	0.092454	3.441506	0.0011
C_L(3)	-0.072568	0.043440	-1.670530	0.0999
C_L(4)	-0.062873	0.024315	-2.585817	0.0121
C_L(5)	-0.107586	0.039540	-2.720915	0.0085

R-squared	0.499821	Mean dependent var	0.000829
Adjusted R-squared	0.467023	S.D. dependent var	0.007920
S.E. of regression	0.005782	Akaike info criterion	-7.395286
Sum squared resid	0.002040	Schwarz criterion	-7.229403
Log likelihood	249.0444	Hannan-Quinn criter.	-7.329738
Durbin-Watson stat	2.052555		

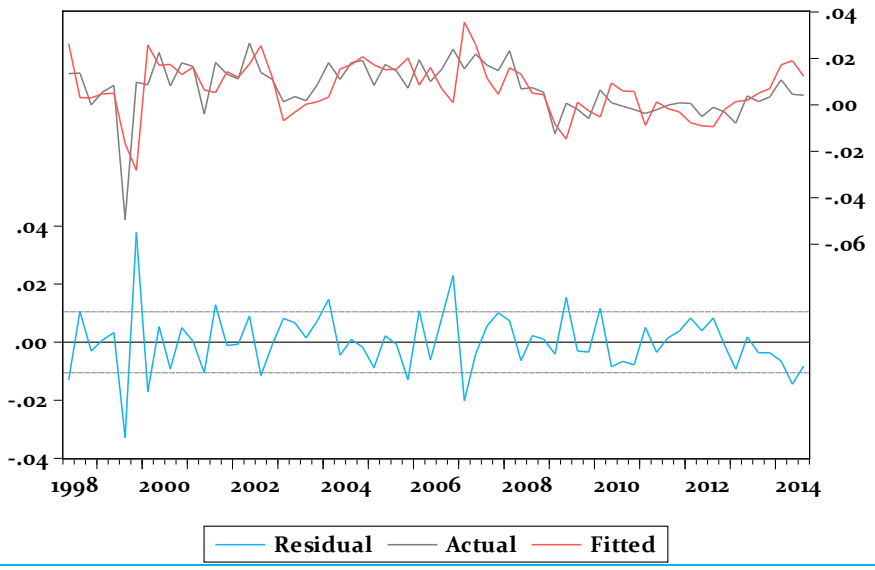


Private consumption, real

Dependent Variable: DLOG(Coo)
Method: Least Squares
Sample (adjusted): 1998Q2 2014Q3
Included observations: 66 after adjustments
DLOG(Coo) =C_C(1)*DLOG(Coo(-1))+(1-C_C(1))*DLOG(DISP_Y)
+C_C2*(R-R(-2))+C_C(3)*(LOG(Coo(-1))-LOG(C_STAR(-1)))
+RES_DLOG_C

	Coefficient	Std. Error	t-Statistic	Prob.
C_C(1)	0.525559	0.077626	6.770408	0.0000
C_C(3)	-0.343556	0.092328	-3.721040	0.0004

R-squared	0.142743	Mean dependent var	0.007080
Adjusted R-squared	0.129348	S.D. dependent var	0.011250
S.E. of regression	0.010497	Akaike info criterion	-6.245621
Sum squared resid	0.007052	Schwarz criterion	-6.179268
Log likelihood	208.1055	Hannan-Quinn criter.	-6.219402
Durbin-Watson stat	2.750244		



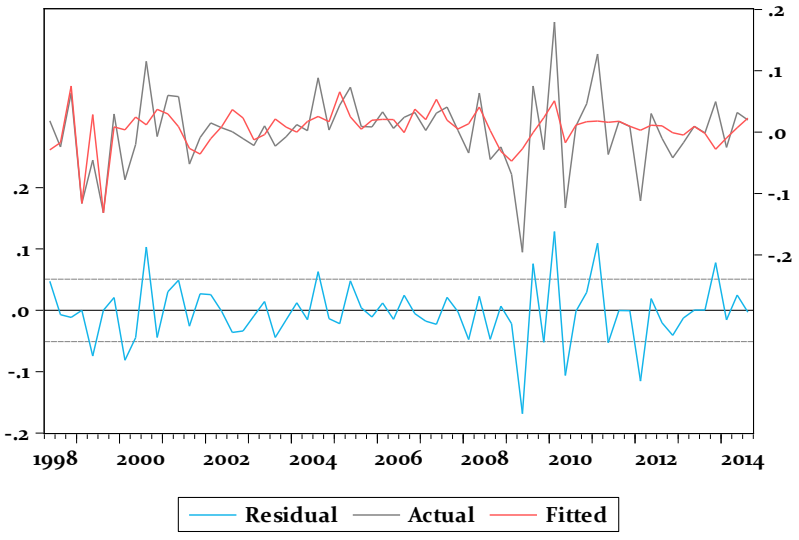
Real investment

Dependent Variable: DLOG(I)
Method: Least Squares
Sample (adjusted): 1998Q2 2014Q3
Included observations: 66 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

```
DLOG(I) =C_I1*((R(-1)+DELTA(-1)+LAMBDA+(R_TAXCIT(-1)
    -@MEAN(R_TAXCIT(-1),"2003q1 2014q3")))-(BETA*Y(-1)/K(-1)))
    +C_I2*D(R)+C_I3*DLOG(G_EXCAPINV/PI)*(TIME>2004.25)+(1
    -C_I(4))*DLOG(@MOVAV(PROFIT(-1)/PI(-1),3))+C_I(4)
    *DLOG(Y)+C_I(5)*(TIME=1999)+C_I(6)*(TIME=1999.5)+C_I(7)
    *@MOVAV(D(R_TAXCIT(-2)),2)+RES_DLOG_I
```

	Coefficient	Std. Error	t-Statistic	Prob.
C_I(4)	0.468956	0.299336	1.566651	0.1223
C_I(5)	-0.148707	0.024516	-6.065633	0.0000
C_I(6)	-0.141037	0.009533	-14.79454	0.0000
C_I(7)	-0.886930	0.502349	-1.765565	0.0824

R-squared	0.235809	Mean dependent var	0.002405
Adjusted R-squared	0.198832	S.D. dependent var	0.060145
S.E. of regression	0.053834	Akaike info criterion	-2.947119
Sum squared resid	0.179684	Schwarz criterion	-2.814413
Log likelihood	101.2549	Hannan-Quinn criter.	-2.894680
Durbin-Watson stat	2.688440		

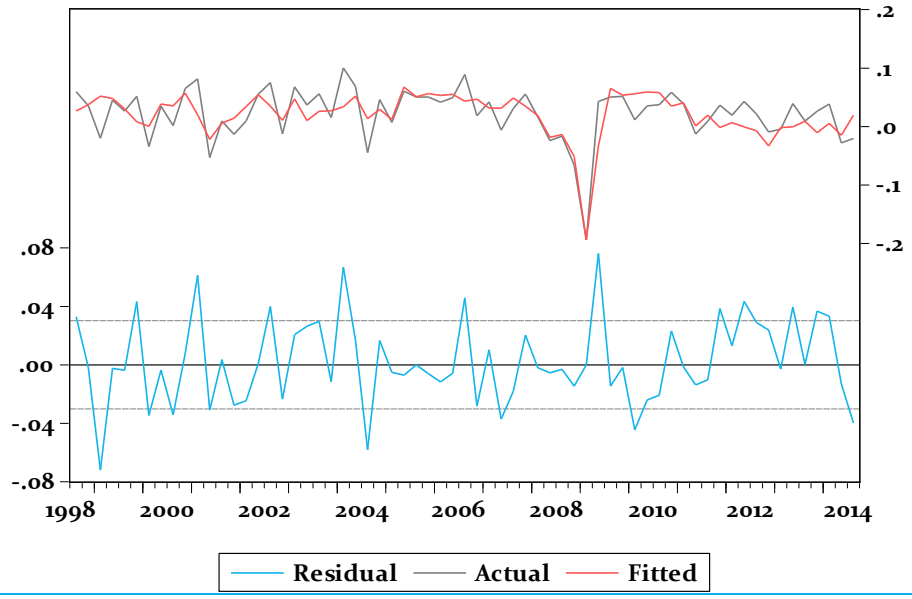


Real exports of goods and services

Dependent Variable: DLOG(X)
Method: Least Squares
Sample (adjusted): 1998Q3 2014Q3
Included observations: 65 after adjustments
DLOG(X) =DLOG(WDR)+C_X(2)*DLOG(RER_X)+C_X(3)
DLOG(DIFF_TFP(-1))+C_X(4)(LOG(X(-1))-LOG(X_STAR(-1)))
+C_X(5)*(TIME=2009)+RES_DLOG_X

	Coefficient	Std. Error	t-Statistic	Prob.
C_X(2)	-0.379226	0.148993	-2.545264	0.0135
C_X(3)	3.521373	0.824474	4.271052	0.0001
C_X(4)	-0.256884	0.086696	-2.963059	0.0043
C_X(5)	-0.113720	0.031640	-3.594127	0.0007

R-squared	0.530642	Mean dependent var	0.022563
Adjusted R-squared	0.507558	S.D. dependent var	0.044310
S.E. of regression	0.031094	Akaike info criterion	-4.044012
Sum squared resid	0.058979	Schwarz criterion	-3.910203
Log likelihood	135.4304	Hannan-Quinn criter.	-3.991216
Durbin-Watson stat	1.973973		

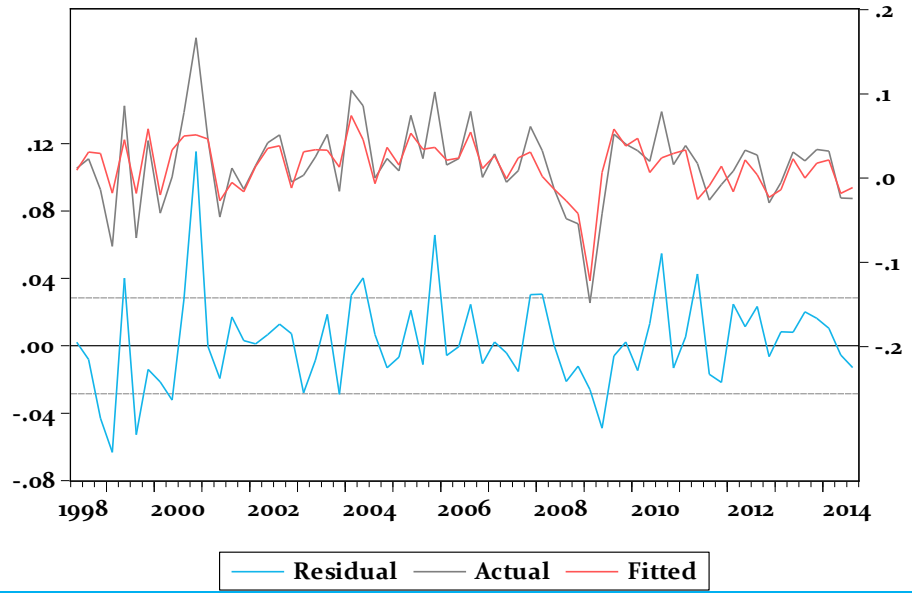


Real imports of goods and services

Dependent Variable: DLOG(M)
Method: Least Squares
Date: 03/26/15 Time: 10:15
Sample (adjusted): 1998Q2 2014Q3
Included observations: 66 after adjustments
DLOG(M) =DLOG(WDI)+C_M(2)*DLOG(RER_M) +C_M(3)
*(LOG(M(-1)) - LOG(M_STAR(-1)))+RES_DLOG_M

	Coefficient	Std. Error	t-Statistic	Prob.
C_M(2)	0.185660	0.145054	1.279938	0.2052
C_M(3)	-0.246556	0.091423	-2.696874	0.0089

R-squared	0.650853	Mean dependent var	0.016664
Adjusted R-squared	0.645398	S.D. dependent var	0.048291
S.E. of regression	0.028757	Akaike info criterion	-4.230058
Sum squared resid	0.052925	Schwarz criterion	-4.163705
Log likelihood	141.5919	Hannan-Quinn criter.	-4.203839
Durbin-Watson stat	1.940326		

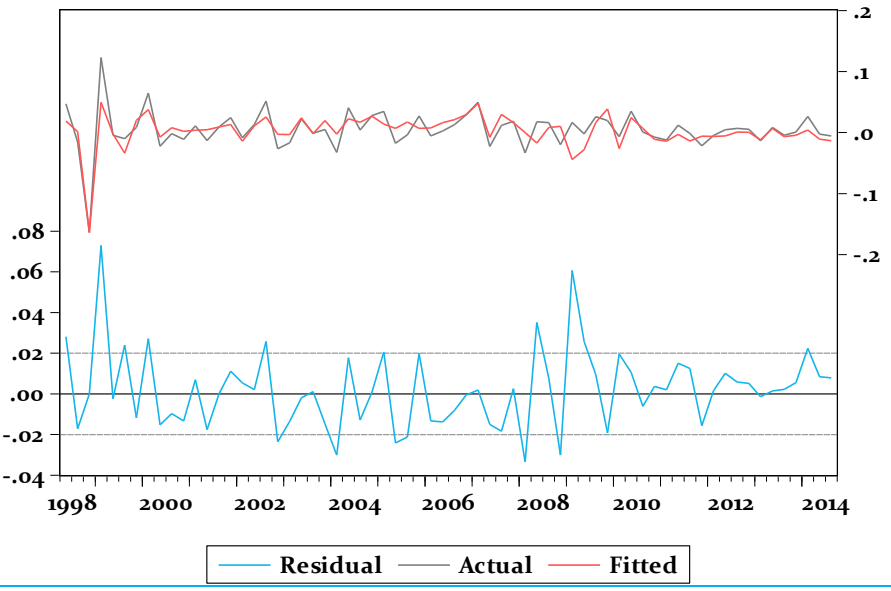


Real gross wages per employee in private sector

Dependent Variable: DLOG(WREAL)
Method: Least Squares
Sample (adjusted): 1998Q1 2014Q3
Included observations: 67 after adjustments
DLOG(WREAL) =C_COMP(1)*DLOG(VA/L_FIRMS)+(1-C_COMP(1))
DLOG(LPROD(-1))+C_COMP(2)(DLOG(PC)-DLOG(PY))
+C_COMP3*(UR_ESA(-1)-NAIRU(-1))+C_COMP4*D(R_SCF)
+C_COMP5*D(R_SCW(-1))+C_COMP6*(LOG(CI_CE_PH(-1))
-LOG(CI_CE_PH_STAR(-1)))+C_COMP(9)*(TIME=1998.75)
+RES_D_CI_CE_PH

	Coefficient	Std. Error	t-Statistic	Prob.
C_COMP(1)	0.586230	0.111796	5.243758	0.0000
C_COMP(2)	-0.804947	0.242094	-3.324939	0.0015
C_COMP(9)	-0.139288	0.024100	-5.779452	0.0000

R-squared	0.598925	Mean dependent var	0.004464
Adjusted R-squared	0.586392	S.D. dependent var	0.032743
S.E. of regression	0.021058	Akaike info criterion	-4.839377
Sum squared resid	0.028379	Schwarz criterion	-4.740659
Log likelihood	165.1191	Hannan-Quinn criter.	-4.800314
Durbin-Watson stat	2.512553		



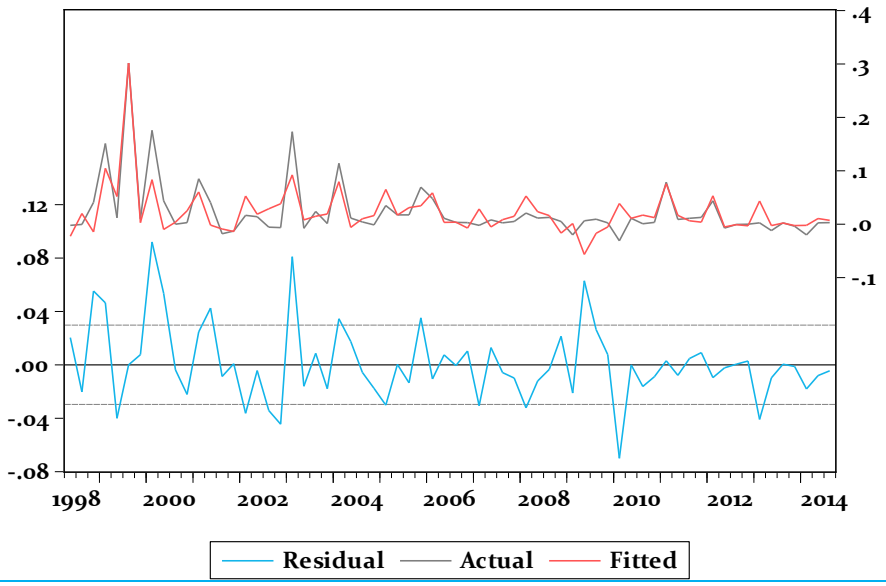
Energy prices

Dependent Variable: DLOG(HEG)
Method: Least Squares
Sample (adjusted): 1998Q2 2014Q3
Included observations: 66 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

DLOG(HEG) =C_HEG(1)*DLOG(PY)+(1-C_HEG(1))*DLOG(@MOVAV(P_OIL*RX_USD,2))+C_HEG(2)*D(R_TAXEXC)*(TIME>2006.5)+C_HEG(3)*(LOG(HEG(-1))-LOG(HEG_STAR(-1)))+C_HEG(4)*(TIME=1999.5)+C_HEG(5)*@SEAS(1)*(TIME<2014)+ RES_DLOG_HEG

	Coefficient	Std. Error	t-Statistic	Prob.
C_HEG(1)	0.902354	0.028350	31.82874	0.0000
C_HEG(2)	1.175437	0.555827	2.114754	0.0385
C_HEG(3)	-0.367905	0.117352	-3.135069	0.0026
C_HEG(4)	0.216240	0.010995	19.66755	0.0000
C_HEG(5)	0.046728	0.013362	3.497162	0.0009

R-squared	0.711552	Mean dependent var	0.023317
Adjusted R-squared	0.692638	S.D. dependent var	0.053619
S.E. of regression	0.029726	Akaike info criterion	-4.120829
Sum squared resid	0.053903	Schwarz criterion	-3.954946
Log likelihood	140.9874	Hannan-Quinn criter.	-4.055281
Durbin-Watson stat	1.955654		



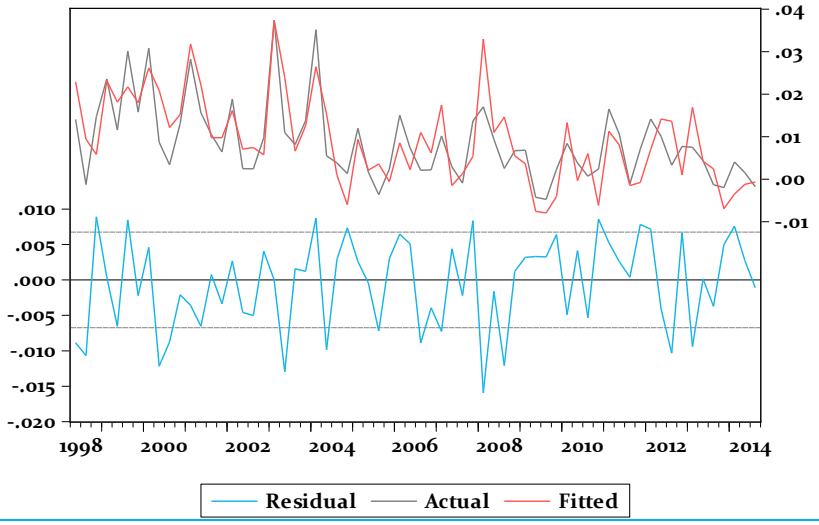
Non-energy prices

Dependent Variable: DLOG(HEX)
Method: Least Squares
Sample (adjusted): 1998Q2 2014Q3
Included observations: 66 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)

DLOG(HEX) =C_HEX(1) * DLOG(CMD(-1))+C_HEX(2)*DLOG(PY) + (1-C_HEX(1)-C_HEX(2))*DLOG(HEX(-1))+C_HEX(3) *D(@MOVAV(R_TAXVAT,4))+C_HEX(4)*(LOG(HEX(-1)) -LOG(HEX_STAR(-1)))+C_HEX(5)*LOG(Y_GAP)+C_HEX(6) *@SEAS(1)*(TIME<2014)+C_HEX(7)*(TIME=2003) +RES_DLOG_HEX

	Coefficient	Std. Error	t-Statistic	Prob.
C_HEX(1)	0.115409	0.041412	2.786867	0.0071
C_HEX(2)	0.258211	0.132070	1.955114	0.0553
C_HEX(3)	0.617734	0.232775	2.653784	0.0102
C_HEX(4)	-0.305252	0.078796	-3.873943	0.0003
C_HEX(5)	0.051278	0.036715	1.396647	0.1678
C_HEX(6)	0.009904	0.001951	5.076510	0.0000
C_HEX(7)	0.024271	0.002829	8.579290	0.0000

R-squared	0.511013	Mean dependent var	0.008662
Adjusted R-squared	0.461286	S.D. dependent var	0.009200
S.E. of regression	0.006753	Akaike info criterion	-7.057775
Sum squared resid	0.002690	Schwarz criterion	-6.825539
Log likelihood	239.9066	Hannan-Quinn criter.	-6.966008
Durbin-Watson stat	2.150444		

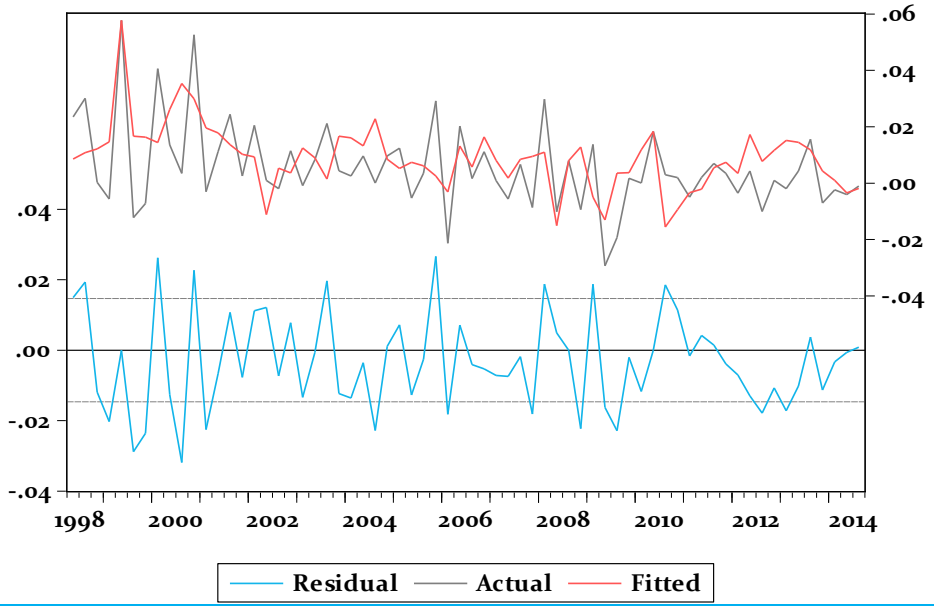


Investment deflator

Dependent Variable: DLOG(PI)
Method: Least Squares
Sample (adjusted): 1998Q2 2014Q3
Included observations: 66 after adjustments
DLOG(PI) =(1-C_PI(1))*DLOG(PI(-1))+C_PI(1)*DLOG(PY(-2))
+C_PI(2)*(LOG(PI(-1))-LOG(PI_STAR(-1)))+C_PI(3)
(TIME=1999.25)+C_PI(4)(TIME=2008.5)+C_PI(5)
*(TIME=2010.25)+RES_DLOG_PI

	Coefficient	Std. Error	t-Statistic	Prob.
C_PI(1)	0.885736	0.108194	8.186540	0.0000
C_PI(2)	-0.449472	0.103171	-4.356579	0.0001
C_PI(3)	0.108807	0.015396	7.067026	0.0000
C_PI(4)	-0.048193	0.016172	-2.980028	0.0041
C_PI(5)	0.035774	0.015328	2.333864	0.0229

R-squared	0.137623	Mean dependent var	0.005664
Adjusted R-squared	0.081074	S.D. dependent var	0.015293
S.E. of regression	0.014660	Akaike info criterion	-5.534663
Sum squared resid	0.013110	Schwarz criterion	-5.368780
Log likelihood	187.6439	Hannan-Quinn criter.	-5.469114
Durbin-Watson stat	2.146199		

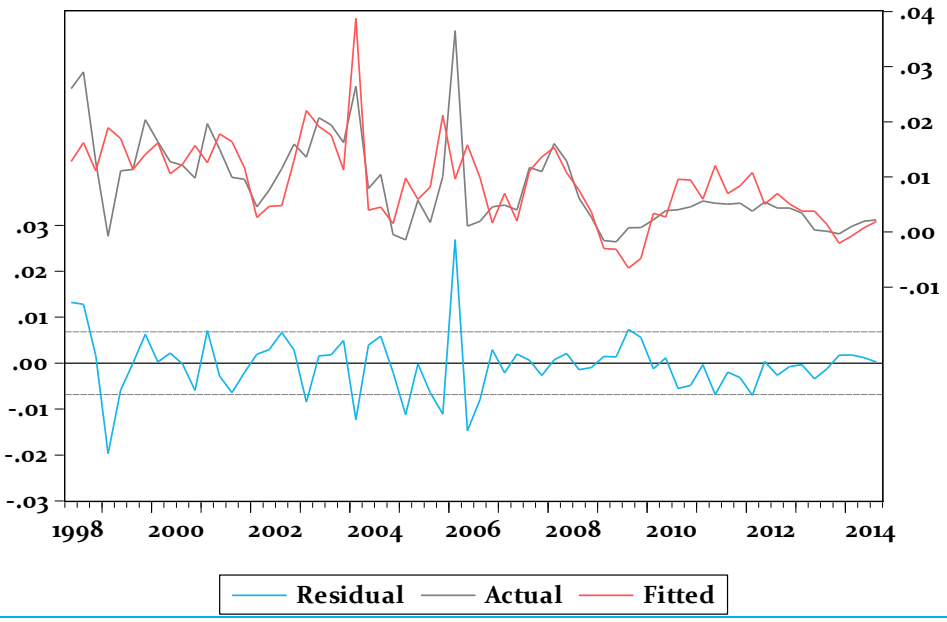


Government consumption deflator

Dependent Variable: DLOG(PG)
Method: Least Squares
Sample (adjusted): 1998Q2 2014Q3
Included observations: 66 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)
DLOG(PG) =(1-C_PG(1))*DLOG(PI)+C_PG(1)*DLOG(PC) +C_PG(2)*(LOG(PG(-1))-LOG(PG_STAR(-1)))+C_PG(3) *(TIME=1999.5)

	Coefficient	Std. Error	t-Statistic	Prob.
C_PG(1)	0.905066	0.078428	11.54006	0.0000
C_PG(2)	-0.060716	0.086324	-0.703345	0.4844
C_PG(3)	-0.050526	0.006827	-7.401432	0.0000

R-squared	0.305374	Mean dependent var	0.008472
Adjusted R-squared	0.283322	S.D. dependent var	0.008055
S.E. of regression	0.006819	Akaike info criterion	-7.093740
Sum squared resid	0.002930	Schwarz criterion	-6.994210
Log likelihood	237.0934	Hannan-Quinn criter.	-7.054411
Durbin-Watson stat	2.102744		

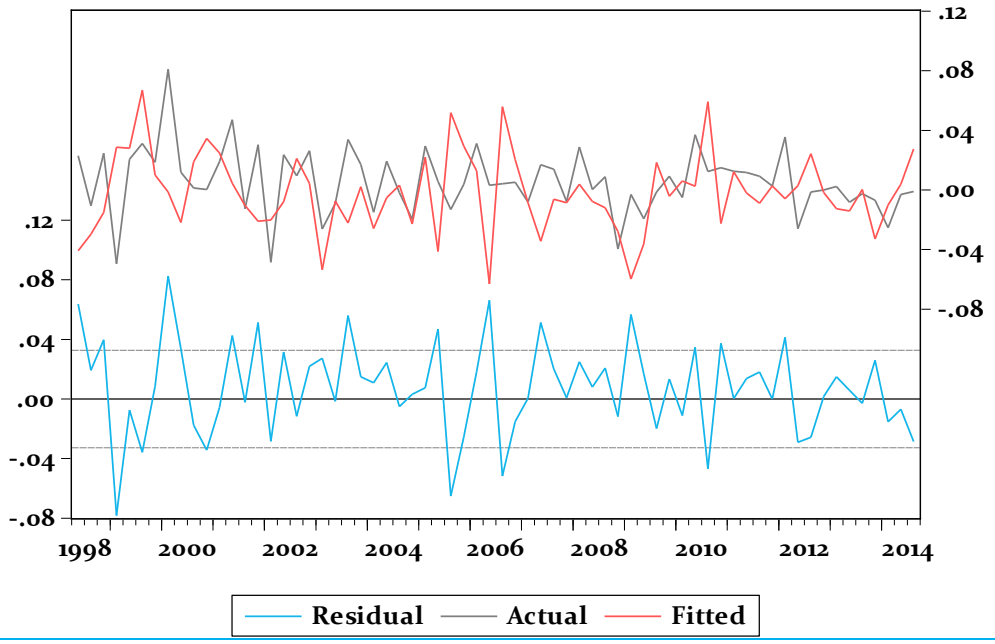


Import deflator

Dependent Variable: DLOG(PM)
Method: Least Squares
Sample (adjusted): 1998Q2 2014Q3
Included observations: 66 after adjustments
DLOG(PM) =C_PM(1)*DLOG(CMD(-1)) + (1-C_PM(1))
*(DLOG(@MOVAV(P_OIL*RX_USD,2)))+C_PM(2)*(LOG(PM(
-1))-LOG(PM_STAR(-1)))+RES_DLOG_PM

	Coefficient	Std. Error	t-Statistic	Prob.
C_PM(1)	0.927285	0.034664	26.75051	0.0000
C_PM(2)	-0.314595	0.122420	-2.569808	0.0125

R-squared	-1.197942	Mean dependent var	0.005672
Adjusted R-squared	-1.232285	S.D. dependent var	0.021899
S.E. of regression	0.032719	Akaike info criterion	-3.971900
Sum squared resid	0.068513	Schwarz criterion	-3.905547
Log likelihood	133.0727	Hannan-Quinn criter.	-3.945681
Durbin-Watson stat	2.073028		

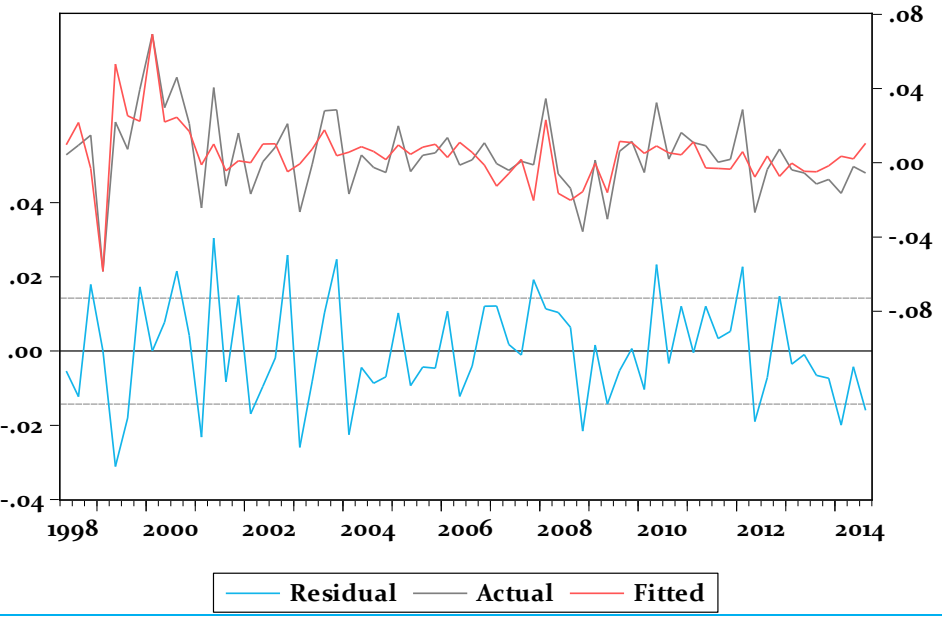


Export deflator

Dependent Variable: DLOG(PX)
Method: Least Squares
Sample (adjusted): 1998Q2 2014Q3
Included observations: 66 after adjustments
DLOG(PX) =C_PX(1)*DLOG(PY) + (1-C_PX(1))*DLOG(CXD)
+C_PX(2)*(LOG(PX(-1))-LOG(PX_STAR(-1))) +C_PX(3)
(TIME=2000)+C_PX(4)(TIME=1999)+RES_DLOG_PX

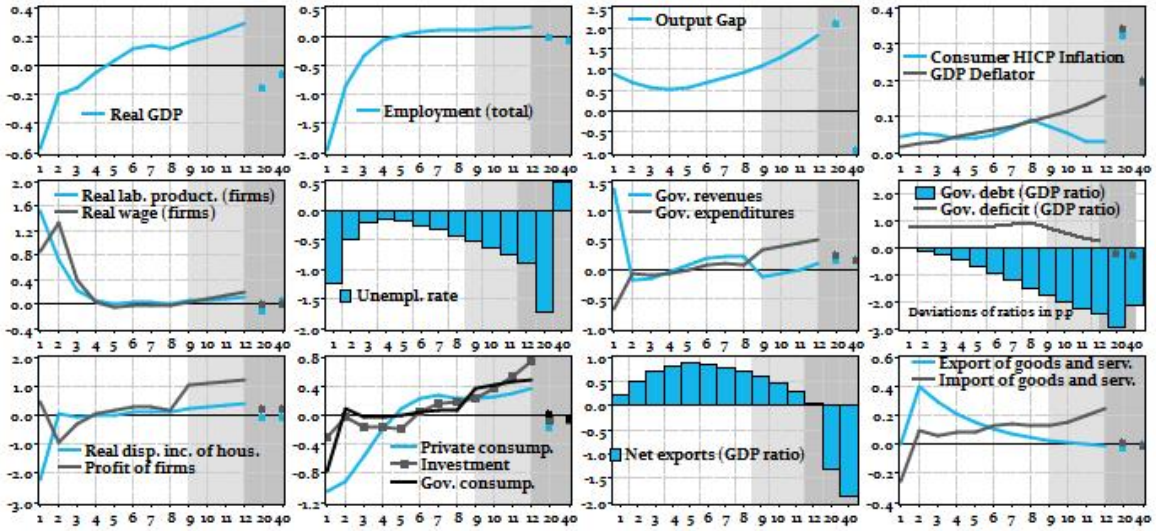
	Coefficient	Std. Error	t-Statistic	Prob.
C_PX(1)	0.669624	0.065309	10.25323	0.0000
C_PX(2)	-0.195151	0.072550	-2.689878	0.0092
C_PX(3)	0.043883	0.015064	2.913216	0.0050
C_PX(4)	-0.089931	0.014477	-6.212002	0.0000

R-squared	0.539779	Mean dependent var	0.004197
Adjusted R-squared	0.517510	S.D. dependent var	0.020543
S.E. of regression	0.014270	Akaike info criterion	-5.602679
Sum squared resid	0.012625	Schwarz criterion	-5.469973
Log likelihood	188.8884	Hannan-Quinn criter.	-5.550241
Durbin-Watson stat	2.256011		



Appendix 5 – Figures

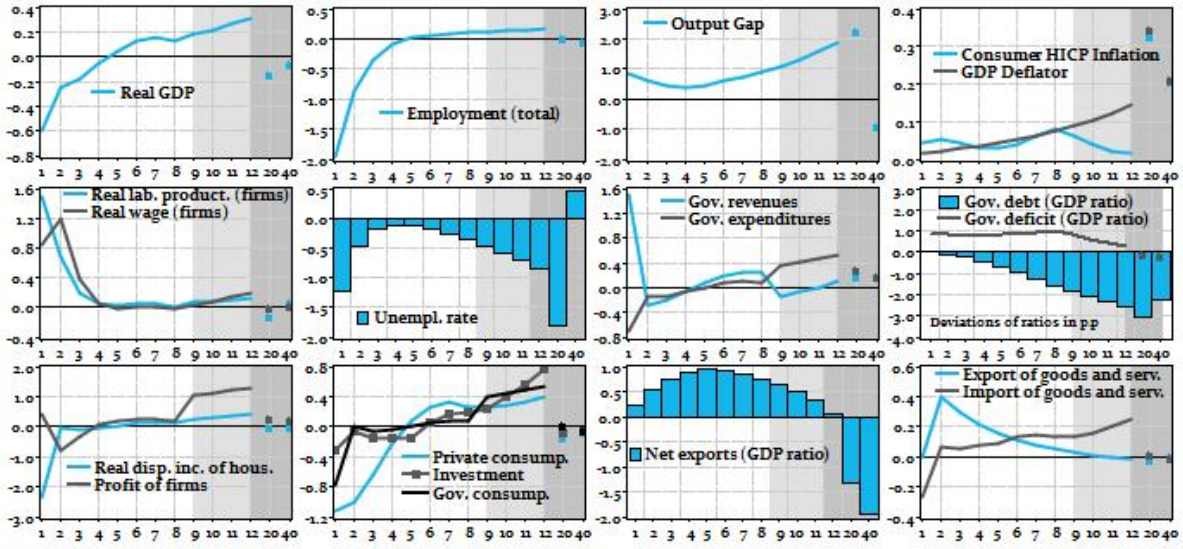
Figure 12: Social security contributions – employees



* Deviations from baseline growth in p.p., time in quarters

Source: author's calculation

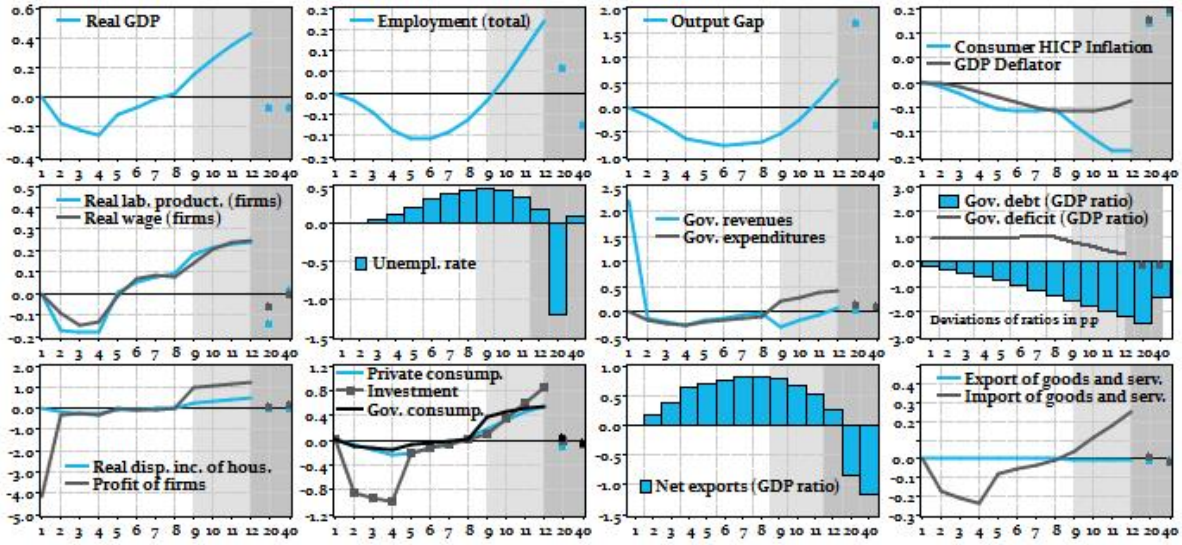
Figure 13: Personal income tax



* Deviations from baseline growth in p.p., time in quarters

Source: author's calculations

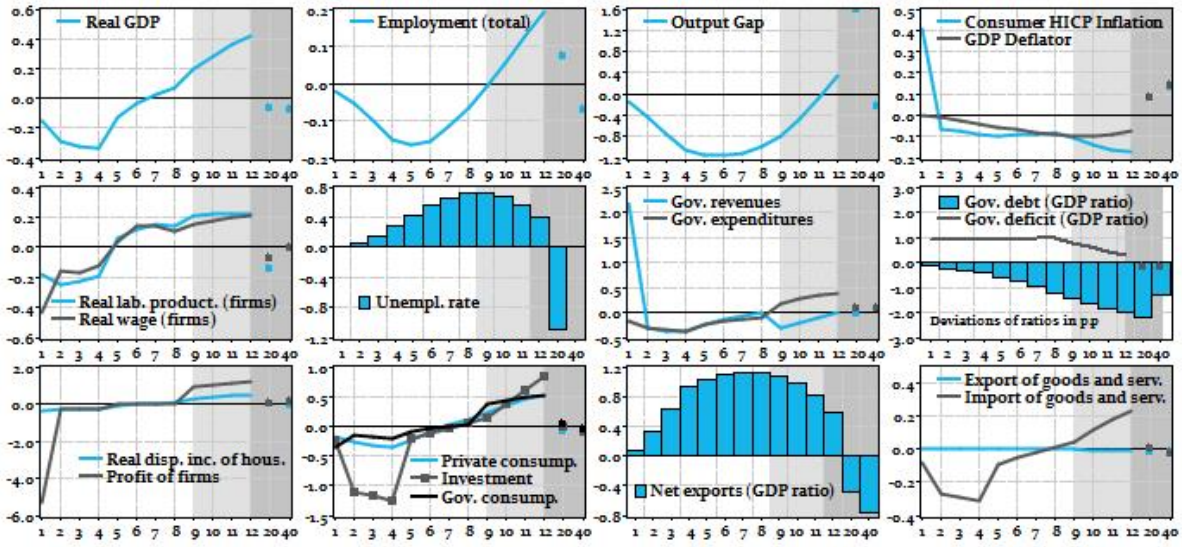
Figure 14: Withholding tax



* Deviations from baseline growth in p.p., time in quarters

Source: author's calculations

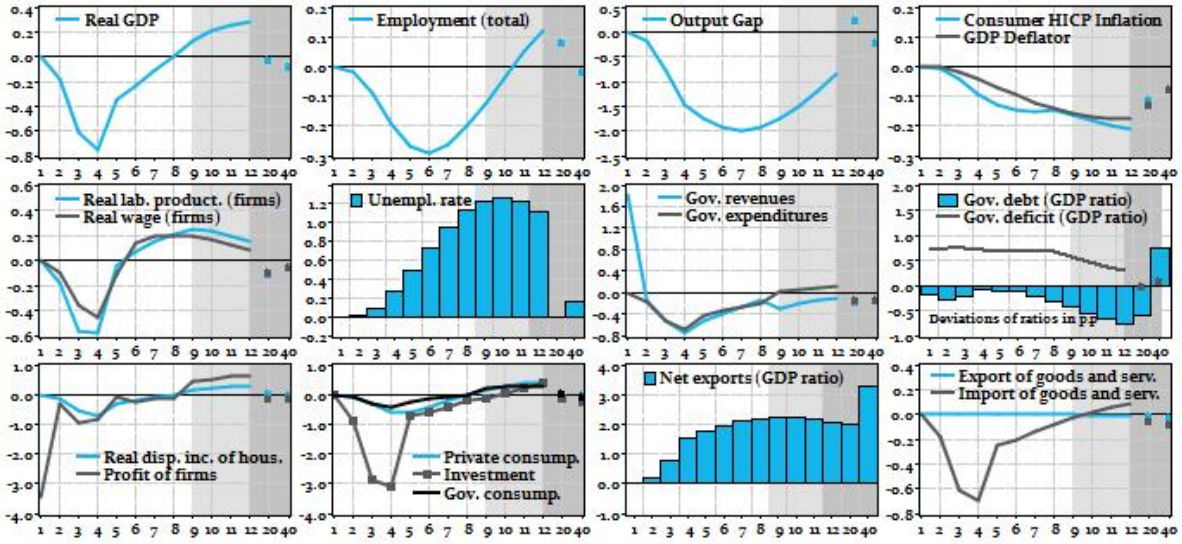
Figure 15: Excise tax



* Deviations from baseline growth in p.p., time in quarters

Source: author's calculations

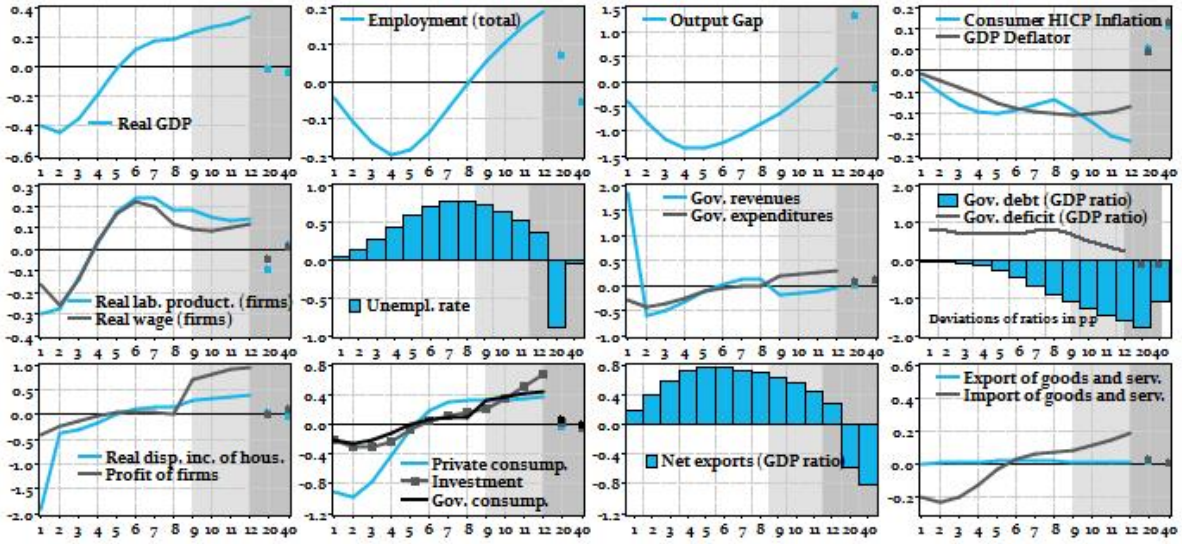
Figure 16: Corporate income tax



* Deviations from baseline growth in p.p., time in quarters

Source: author's calculations

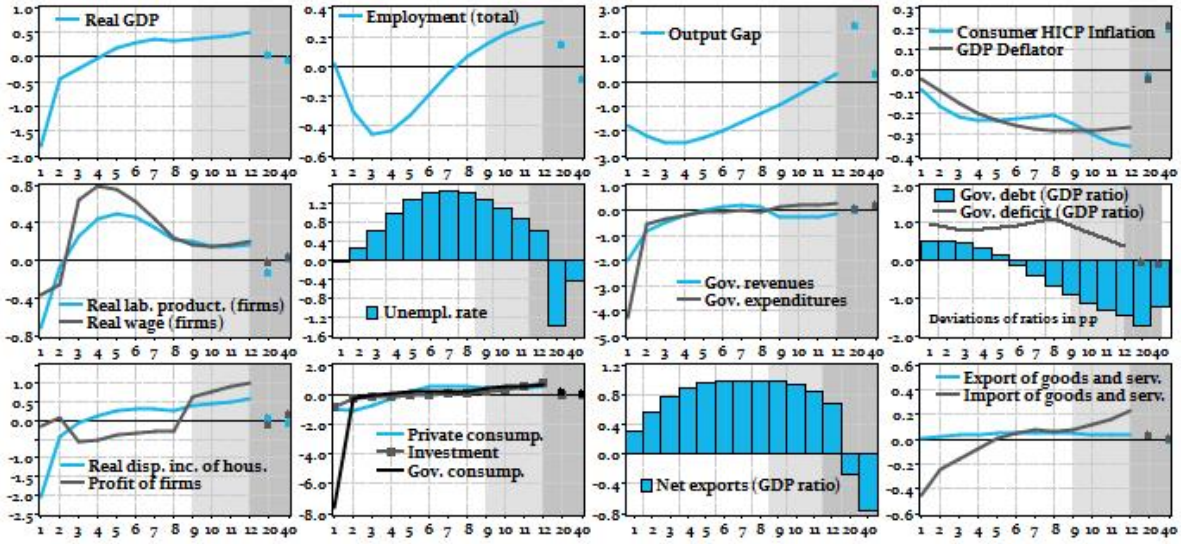
Figure 17: Property tax



* Deviations from baseline growth in p.p., time in quarters

Source: author's calculations

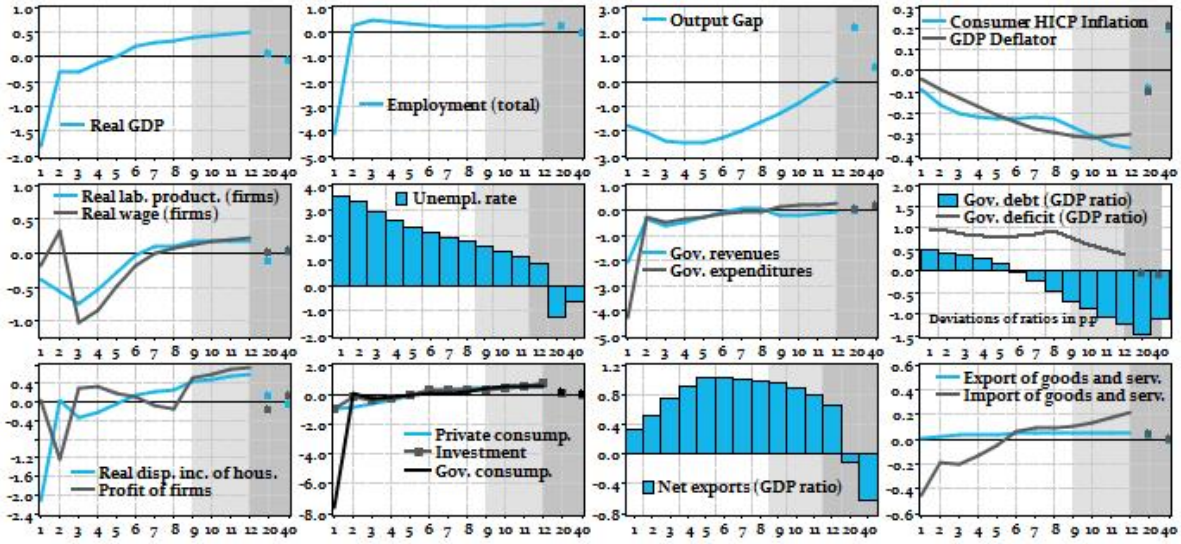
Figure 18: Government wages expenditure – average wages



* Deviations from baseline growth in p.p., time in quarters

Source: author's calculations

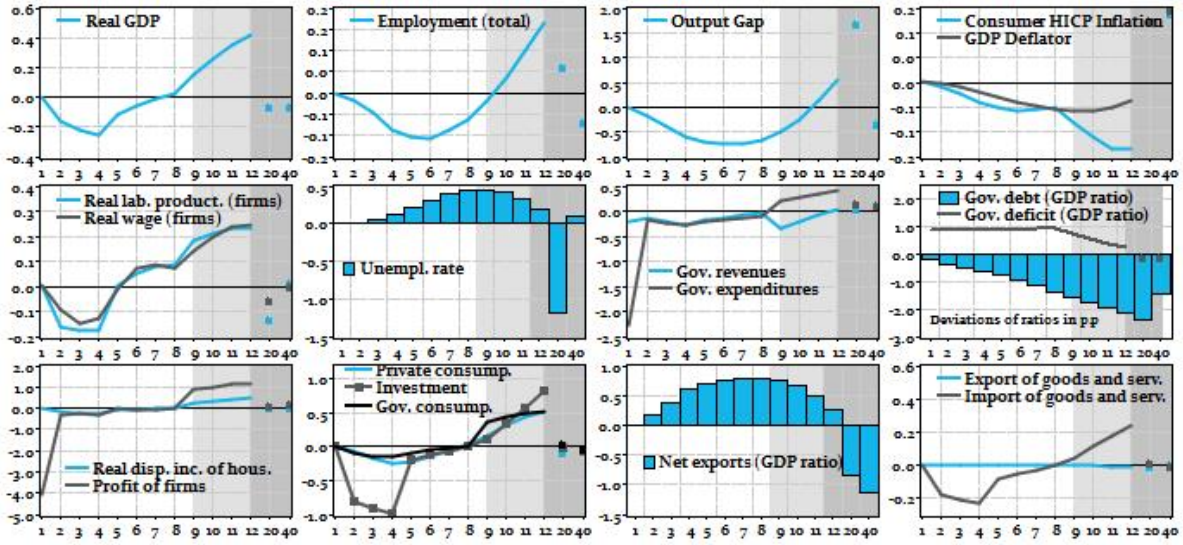
Figure 19: Government wages expenditure – employees



* Deviations from baseline growth in p.p., time in quarters

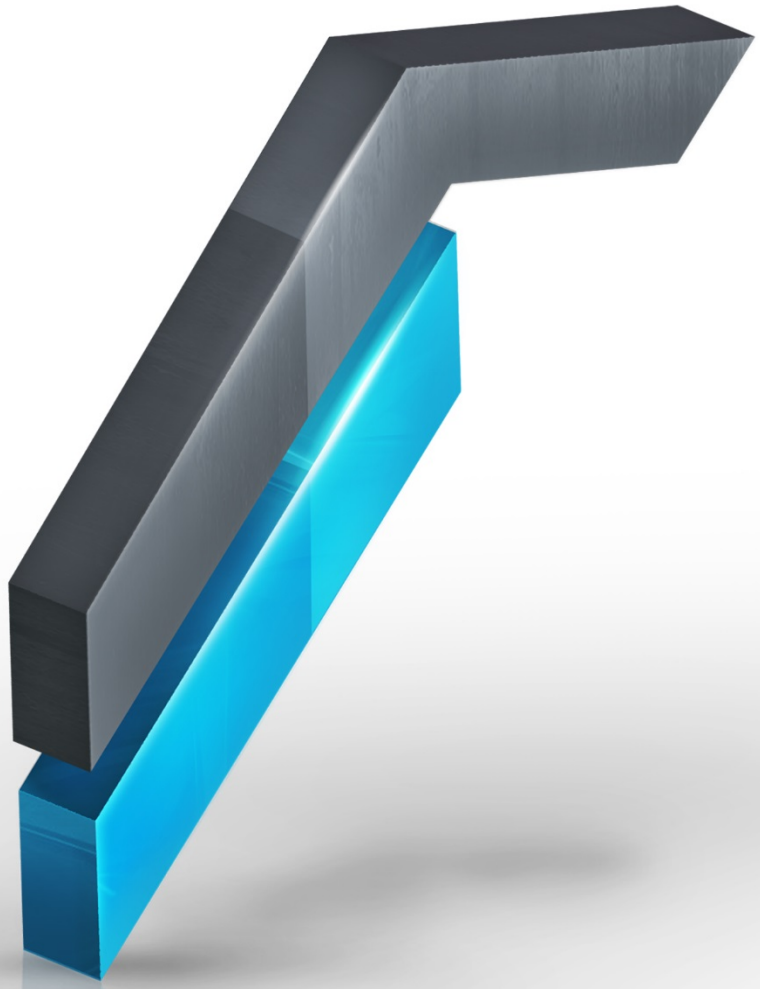
Source: author's calculations

Figure 20: Government subsidies – capital transfers expenditures



* Deviations from baseline growth in p.p., time in quarters

Source: author's calculations



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